

Surface Mining near Underground Mining

No surface mining is currently taking place in the vicinity of the New Elk Mine. To the Operator's knowledge, no surface mines are planned in the nearfuture which would conflict with the operation of the New Elk Mine.

Subsidence Survey, Monitoring and Control Plan

A subsidence control plan has been prepared for the New Elk Mine and is included in Exhibit 24. All structures that exist in the permit and adjacent areas are shown on **Map 20-Sheets 1-7, Map 11, and Map 12**. The structures listed in Exhibit 42 and Table 19. An additional survey was conducted for the PR-6 area. No cultural resources recommended for further investigation or building structures were found (Exhibit 7) and structures related to oil and gas development and roads are shown on the Map 20 series and are covered by the existing control, monitoring, and mitigation plans as presented in Exhibit 24.

The renewable resource lands existing in the form of the Purgatoire River and associated alluvial valley floor are unlikely to be impacted by any anticipated subsidence in the mining plan. The locations of these renewable resources are shown on **Map 20**. The description of the renewable resource lands is in Exhibit 8. The current mining plan under the Purgatoire River and associated alluvial valley floor are development-only workings and do not have any retreat panels. The extraction ratio is planned to be less than 50% for these workings.

The stability of development-only workings, as well as retreat panel workings was analyzed using the Analysis of Retreat Pillar Mining Stability (ARMPS) computer code developed by NIOSH. The program uses the modified Mark-Bieniawski pillar stability formula and evaluates the stability within a zone comprising a number of pillars.

Development-only pillar dimensions were developed for areas such as underneath the renewable resource lands mentioned above, and areas with cover depth and mining height combinations that precluded the use of retreat mining. Stable panel pillar dimensions were developed for various cover depth and mining height combinations using ARMPS. The details of this analysis are included in Exhibit 24.

If subsidence has occurred in the permit area, caused by past mining, no material damage to structures or renewable resource land has occurred. No discernible effects can be attributed to subsidence induced by the old New Elk Mine workings. This is supported by the stable condition of the Colorado & Wyoming Railroad right-of-way and Colorado Highway 12.

There are no structures that will be undermined using retreat methods and subsided in this permit application. The details of structures 44, 45, 46, and 47 are shown in relation to the permit boundary and mine plan in Figure 19. Mining detail, showing development-only mining areas and retreat (pillar